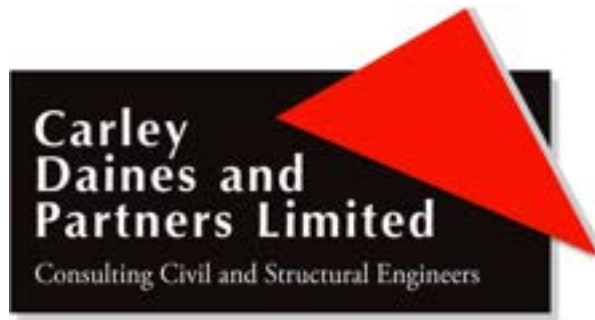




11 Bridgewater Road, Walkden, Worsley, Manchester M28 3JE
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SITE ADJACENT TO DALTON AVENUE

**FALLOWFIELD
MANCHESTER M14 7NR**



VALIDATION REPORT *UNDERTAKEN FOR* DENTON CONSTRUCTION

Ref:26-B-13509/Dalton Avenue

March 2026

Principal: **D.J. Middleton BEng(Hons) CEng MStructE**
Company Number: **11006567**
Address **11 Bridgewater Road, Walkden, Worsley, Manchester M28 3JE**
VAT Number: **285 0439 91**



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- 5 - REMEDIATION STATEMENT**
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1.0 INTRODUCTION & OBJECTIVES

This report has been prepared at Manchester Council's request following the undertaking of the Phase 1 and 2 Site Investigations as well as a remediation statement.

The site is located adjacent to Dalton Avenue, Fallowfield, at approximate National Grid Reference 384370, 394810 and at post code M14 7NR.

The purpose of this Validation Report is to provide a summary of investigation works undertaken on the site, to summarise the agreed Remediation Strategy, and to present relevant documentation to demonstrate that the works have been completed in accordance with the agreed methodology.

2.0 SITE DEVELOPMENT

Planning Approval gave permission for a proposed residential development of 8 apartments in 2 individual blocks plus associated access, drainage and services.

3.0 RELEVANT PARTIES

The relevant parties to the development are as follows:

- Planning Authority – Manchester Council
- Client – MSV Housing
- Contractor – Denton Construction
- Architect – TADW
- Engineering Consultant – Carley Daines & Partners
- Site Investigation Consultant – Carley Daines & Partners
- Specialist Sub-Contractors – Various
- Building Regulations Authority – Manchester Council
- Highway Authority – Manchester Council
- Drainage Authority – United Utilities

4.0 SITE APPRAISAL & KEY REFERENCE DOCUMENTS

In order to fulfil the requirements of the Planning Condition, the following procedure has been adopted and the following documents reviewed:



Phase 1 Preliminary Risk Assessment – Carley Daines and Partners – dated 17th November 2022

This is a Phase 1 assessment that considers the site in its correct environmental and historical setting and makes recommendations for further investigations.

Phase 2 Geo-Environmental Investigation and Assessment – Carley Daines and Partners – dated 2nd October 2023

This is a detailed assessment of on-site contamination and its implications. Testing was carried out for a variety of contaminants, specifically metals and heavy metals, PAH (USEPA 16), asbestos, TPH, Phenols, BTEX and MTBE.

The report concluded that contamination testing indicated some exceedances were encountered in respect of Lead, PAH and TPH and believed to be typical of light engineering and motor trade activities with a possible source being spilt fuels and oil. These are a potential risk to human health and are based on S4UL / C4SL – “Residential with Home Grown Produce – SOM 1%”. This is the most conservative assessment.

Ground gas monitoring was undertaken with findings published in a Supplementary Report dated 22nd February 2024. The Report identified elevated levels of carbon dioxide and recommended sub-structure gas protection to an “Amber 1” level as assessed against NHBC criteria.

5.0 REMEDIATION STATEMENT

The Remediation Statement is included in full in Appendix 5. This collates all previous reports and recommends that the required provision is as follows:

1. The construction of a capping layer 300mm thick to soft landscaped areas, comprising the following.
 - An upper layer of 150mm of clean inert topsoil
 - A lower layer of 150mm of clean inert subsoil
2. Installation of a gas membrane to mitigate against Carbon Dioxide to CS2/Amber 1 level.

6.0 VARIATIONS TO THE REMEDIATION STATEMENT

There have been no significant variations to the Remediation Strategy during the works.

As a general comment, site conditions were found to be as had been anticipated and were generally in line with the comments above in the various site investigation reports, and the Remediation Strategy.

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7.0 SITE VALIDATION

7.1 Topsoil Placement/Capping Layer

The areas of site to be remediated with a clean capping layer are indicated as the soft landscaping areas on the drawing in Appendix 2. In relation to the overall site, these amount to approximately 10% of the site. In these areas, a 300mm clean capping layer has been placed, and depth validation photographs are included in Appendix 4.

Soil test sample results have been taken for all imported material, which can be confirmed as clean, chemically uncontaminated and fit for purpose. Testing has been carried out for metals, PAH, TPH, asbestos, toluene, benzene, ethylbenzene and xylenes. Results are presented in Appendix 3.

Elsewhere, any pathway between contamination and potential future human receptors is broken by hard cover. The hard cover comprises the footprints of the buildings and paths.

7.2 Gas Membrane installation

A validation for the installation of the gas membrane is included in Appendix 6.

8.0 VALIDATION STATEMENT

Based upon site inspections and documentary evidence from Denton Construction, together with on-site testing and appraisal, it is our opinion that the works undertaken have been carried out satisfactorily and the remediation targets have been achieved.

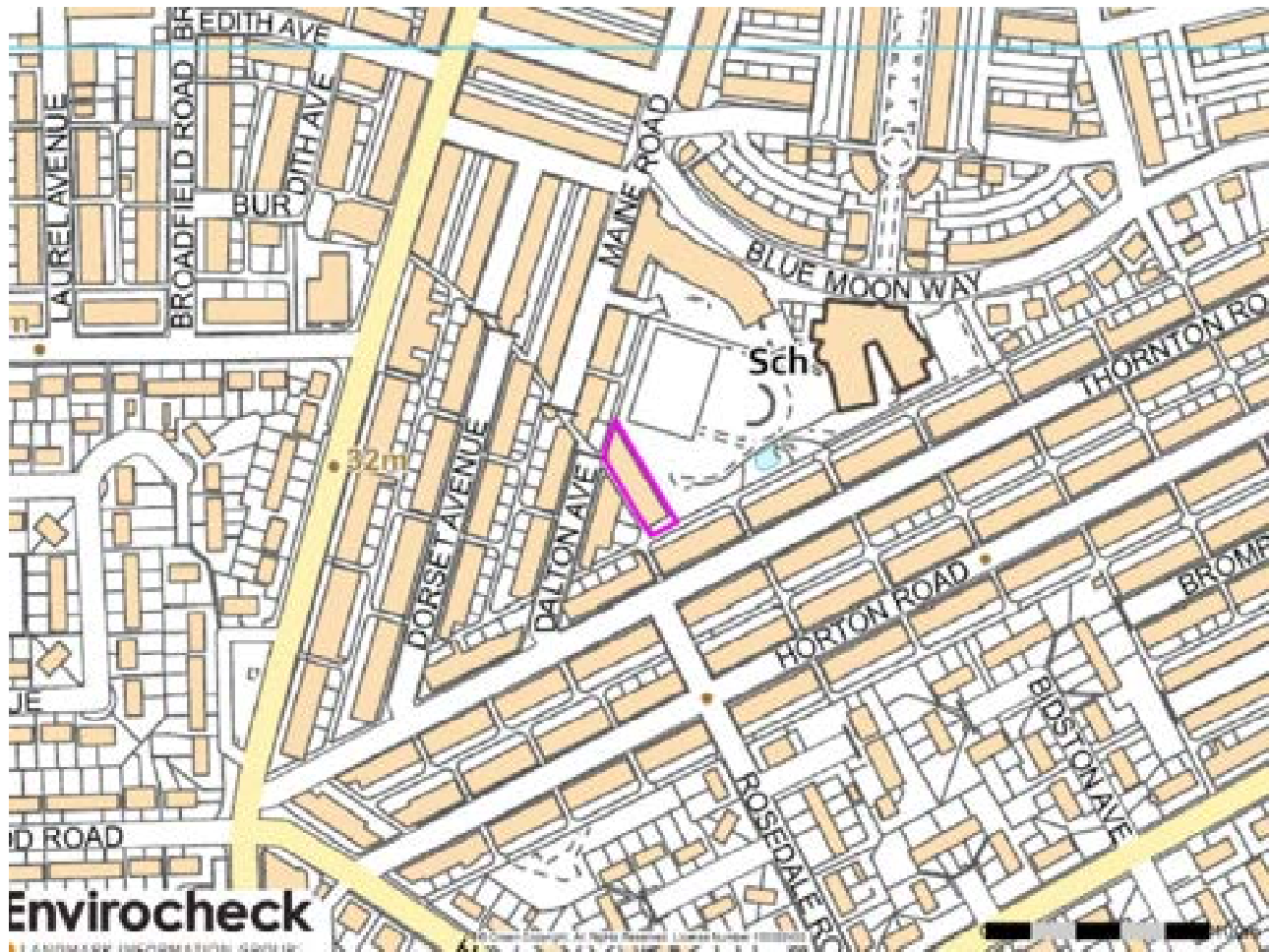
Given this we are of the opinion that health risks from the ground should be minimal in the future.



APPENDIX 1

SITE LOCATION PLAN

Principal: **D.J. Middleton BEng(Hons) CEng MIStructE**
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APPENDIX 2

REMEDIATED AREAS

Divine Mercy
Primary School





APPENDIX 3

IMPORTED SOIL TEST RESULTS

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Company Number: **11006567**
Address **11 Bridgewater Road, Walkden, Worsley, Manchester M28 3JE**
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**Denton Construction
8 Bexley Square
Salford
M3 6BZ**

12th March 2026

Validation of Existing Topsoil: Dalton Avenue, Fallowfield, Manchester M14 7NR

Planning Reference: 137461/FO/2023

Pearl Environmental were requested by Denton Construction (the developer) to assess the chemical suitability of imported topsoil in soft landscaped areas at the above residential development at Dalton Avenue.

Consequently, on 27th February 2026, we attended site to collect 3no. topsoil samples and deliver them to the laboratory for a suitable test suite. It is understood that 10 tonnes of topsoil had been delivered (from a greenfield source), but only 5 tonnes had in fact been required to provide a growing medium in the 'planters.' At this time the build was still incomplete and the planters were observed as bare soil.



Photo 1: Plot 5 Planter

A trial pit was hand dug in 3 areas to a depth of approximately 200mm, at the locations shown below in Figure 1, and a sample was recovered at each.



Figure 1. Location of Soil Sampling 27/2/2026

Each sample was collected in a 500ml plastic tubs and a 250ml amber glass jar and transported by Pearl Environmental to Envirolab at Hyde for a range of MCERTS and UKAS accredited analysis. The samples are described as a loamy sand with stones.

The results of the analysis are attached to this report for reference. In assessing the results for human health exposure to contamination, we refer to a number of criteria obtained from various sources which are based on the most conservative use (residential with consumption of home grown produce). As the % Soil Organic Matter (% SOM) was recorded between 4.62% and 5.02%, the thresholds at SOM (2.5%) are used for a conservative reference.

Table 1 and 2 below summarise the assessment of all 3 samples against these criteria. No statistical analysis of the data has been undertaken due to the low concentrations encountered.

TABLE 1. Summary of Analysis: Metals and Inorganics					
	No of samples	Range (mg/kg)	Assessment criteria (residential)	No of samples failing	Locations of failures
Arsenic	3	7	37 ³	0	-
Cadmium	3	<1.0	11 ³	0	-
Chromium (total)	3	14-16	910 ³	0	-
Chromium (hexavalent)	3	<1	6 ³	0	-
Copper	3	13-14	2400 ³	0	-
Lead	3	23-25	200 ¹	0	-
Mercury	3	<0.17	40 ³	0	-
Nickel	3	10-12	180 ³	0	-
Selenium	3	<1	250 ³	0	-
Zinc	3	49-51	3700 ³	0	-
pH	3	8.18-8.26	-	0	-
Asbestos	3	ND	ND	0	-
Soil Organic Matter %SOM	3	4.62-5.02			

¹ DEFRA : SP10130 : Category 4 Screening Levels-

² Atkins Atrisk SSV residential with home grown produce (1% SOM)

³ LQM and CIEH S4UL's for Human Health Risk Assessment (Registration No. S4UL 3265) residential with home grown produce (2.5% SOM)

⁴ BRE Special Digest 1:2005 DS-1 (units in g/l)

ND – None Detected

TABLE 2. Summary of Analysis: Organics (PAHs)

	No of samples	Range (mg/kg)	Assessment criteria ¹ (mg/kg) (residential)	No of samples failing	Locations of failures
Acenaphthene	3	<0.01 – 0.01	510	0	-
Acenaphthylene	3	<0.01	420	0	-
Anthracene	3	<0.02 – 0.03	5400	0	-
Benzo[a]anthracene -	3	0.08-0.17	11	0	-
Benzo[a]pyrene	3	0.08-0.17	2.7	0	-
Benzo[b]fluoranthene	3	0.14-0.25	3.3	0	-
Benzo[ghi]perylene	3	0.06-0.12	340	0	-
Benzo[k]fluoranthene	3	<0.07	93	0	-
Chrysene	3	0.10-0.21	22	0	-
Dibenz[ah]anthracene	3	<0.04	0.28	0	-
Fluoranthene	3	0.13-0.31	560	0	-
Fluorene	3	<0.01-0.01	400	0	-
Indeno[123-cd]pyrene	3	0.08-0.13	36	0	-
Napthalene	3	<0.03	5.6	0	-
Phenanthrene	3	0.06-0.14	220	0	-
Pyrene	3	0.10-0.27	1200	0	-

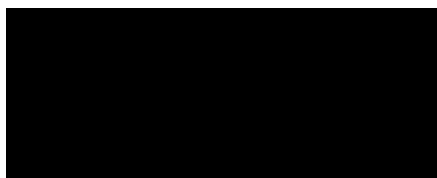
¹ LQM and CIEH S4UL's for Human Health Risk Assessment (Registration No. S4UL 3265) residential with home grown produce (2.5% SOM)

² DEFRA : SP1010 : Category 4 Screening Levels

The assessment tables show there to be no contaminants present in the imported topsoil at Dalton Avenue which exceed the adopted assessment criteria concentrations. This demonstrates the suitability of the soil to be used in soft landscaped areas of this residential development.

This document should be forwarded to Manchester City Council for approval in order to discharge the relevant planning condition.

Yours Sincerely,



Enc: Envirolab 26/02360

FINAL ANALYTICAL TEST REPORT

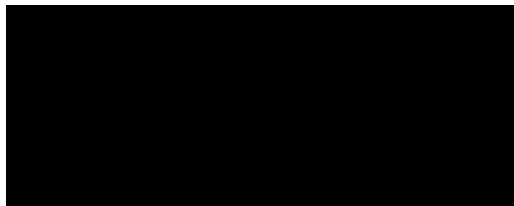
Envirolab Job Number: 26/02360
Issue Number: 1

Date: 11 March, 2026

Client: Pearl Environmental (UK) Ltd
58 Marford Crescent
Sale
Cheshire
UK
M33 4DH

Project Manager: Keith Lewis
Project Name: Dalton Ave
Project Ref: N/A
Order No: KL2702
Date Samples Received: 27/02/26
Date Instructions Received: 02/03/26
Date Analysis Completed: 11/03/26

Approved by:



Client Manager

Envirolab Job Number: 26/02360

Client Project Name: Dalton Ave

Client Project Ref: N/A

Lab Sample ID	26/02360/1	26/02360/2	26/02360/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	Plot 3	Plot 5	Plot 7							
Depth to Top	0.2	0.2	0.2							
Depth To Bottom										
Date Sampled	27-Feb-26	27-Feb-26	27-Feb-26							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	4A	4A	4A							
% Stones >10mm _A	<0.1	<0.1	<0.1					% w/w	0.1	A-T-044
pH _D ^{M#}	8.19	8.26	8.18					pH	0.01	A-T-031s
Organic Matter _D ^{M#}	5.02	4.62	4.72					% w/w	0.14	A-T-032s
Arsenic _D ^{M#}	7	7	7					mg/kg	1	A-T-024s
Cadmium _D	<1.0	<1.0	<1.0					mg/kg	1	A-T-024s
Copper _D ^{M#}	13	13	14					mg/kg	1	A-T-024s
Chromium _D ^{M#}	14	14	16					mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1					mg/kg	1	A-T-040s
Lead _D ^{M#}	23	23	25					mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17					mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	10	10	12					mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1					mg/kg	1	A-T-024s
Zinc _D ^{M#}	49	50	51					mg/kg	1	A-T-024s

Envirolab Job Number: 26/02360

Client Project Name: Dalton Ave

Client Project Ref: N/A

Lab Sample ID	26/02360/1	26/02360/2	26/02360/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	Plot 3	Plot 5	Plot 7							
Depth to Top	0.2	0.2	0.2							
Depth To Bottom										
Date Sampled	27-Feb-26	27-Feb-26	27-Feb-26							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	4A	4A	4A							
Asbestos in Soil (inc. matrix) ^										
Asbestos in soil [#]	NAD	NAD	NAD							A-T-045
Asbestos Matrix (visual) _D	-	-	-							A-T-045
Asbestos Matrix (microscope) _D	-	-	-							A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A							A-T-045

Envirolab Job Number: 26/02360

Client Project Name: Dalton Ave

Client Project Ref: N/A

Lab Sample ID	26/02360/1	26/02360/2	26/02360/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	Plot 3	Plot 5	Plot 7							
Depth to Top	0.2	0.2	0.2							
Depth To Bottom										
Date Sampled	27-Feb-26	27-Feb-26	27-Feb-26							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	4A	4A	4A							
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	<0.01	0.01					mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	0.03					mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.08	0.08	0.17					mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.08	0.09	0.17					mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.14	0.14	0.25					mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.06	0.08	0.12					mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07					mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.10	0.12	0.21					mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04					mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.13	0.13	0.31					mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	0.01					mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.08	0.08	0.13					mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03					mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.06	0.07	0.14					mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.10	0.10	0.27					mg/kg	0.07	A-T-019s
Total PAH-16MS_A^{M#}	0.83	0.89	1.82					mg/kg	0.01	A-T-019s

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs
Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.					

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as “% stones >10mm”.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.

Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Pearl Environmental (UK) Ltd, 58 Marford Crescent , Sale, Cheshire, UK, M33 4DH	Project No:	26/02360
Project:	Dalton Ave	Date Received:	02/03/2026 (am)
Clients Project No:	N/A	Cool Box Temperatures (°C):	9.1

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	26/02360/1	26/02360/2	26/02360/3
Client Sample No			
Client Sample ID/Depth	Plot 3 0.2m	Plot 5 0.2m	Plot 7 0.2m
Date Sampled	27/02/26	27/02/26	27/02/26
A-T-019s	04/03/2026	04/03/2026	04/03/2026
A-T-024s	09/03/2026	09/03/2026	09/03/2026
A-T-031s	11/03/2026	11/03/2026	11/03/2026
A-T-032s	11/03/2026	11/03/2026	11/03/2026
A-T-040s	06/03/2026	06/03/2026	06/03/2026
A-T-044	11/03/2026	11/03/2026	11/03/2026
A-T-045	04/03/2026	04/03/2026	04/03/2026

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report



APPENDIX 4

**SOIL DEPTH VALIDATION PHOTOS
(SEE SEPARATE ZIP FILE FOR PHOTOGRAPHS)**

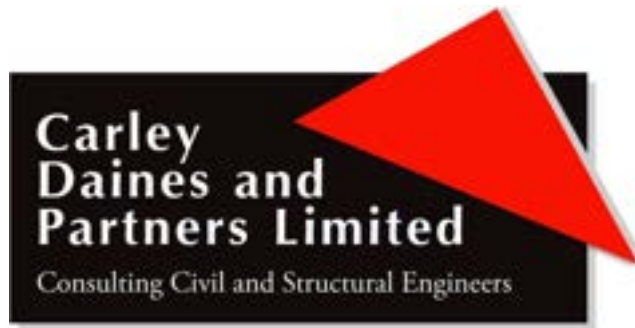
Principal: **D.J. Middleton BEng(Hons) CEng MIStructE**
Company Number: **11006567**
Address **11 Bridgewater Road, Walkden, Worsley, Manchester M28 3JE**
VAT Number: **285 0439 91**



APPENDIX 5

REMEDIATION STRATEGY

Principal: **D.J. Middleton BEng(Hons) CEng MIStructE**
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Address **11 Bridgewater Road, Walkden, Worsley, Manchester M28 3JE**
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SITE ADJACENT TO DALTON AVENUE

**FALLOWFIELD
MANCHESTER M14 7NR**



PHASE 3 REMEDIATION STATEMENT

UNDERTAKEN FOR
MSV HOUSING

Ref:23-B-13509/Dalton Avenue

Revision A

April 2024

Principal: **D.J. Middleton BEng(Hons) CEng MStructE**
Company Number: **11006567**
Address **11 Bridgewater Road, Walkden, Worsley, Manchester M28 3JE**
VAT Number: **285 0439 91**



Report Title:	Dalton Avenue, Fallowfield, Manchester, M14 7NR
Report Reference:	23-B-13509
Revision:	A – 31.05.24
Client:	MSV Housing
Issue Date:	30th April 2024
Authorised By:	D.J. Middleton

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Principal: **D.J. Middleton BEng(Hons) CEng MStructE**
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VAT Number: **285 0439 91**



1.0 INTRODUCTION

This report has been prepared at MSV Housing's request following the undertaking of the Phase 1 and 2 Site Investigations.

The site is located adjacent to Dalton Avenue, Fallowfield, at approximate National Grid Reference 384370, 394810 and at post code M14 7NR.

2.0 PROPOSED DEVELOPMENT

Plans that have been made available to us indicate that the site is to be developed with 8 flats in 4 individual blocks plus associated access, drainage, services and parking infrastructure.

3.0 PHASE 1 INVESTIGATION

Phase 1 and Phase 2 investigations have been undertaken by Messrs Carley Daines and Partners Ltd. The final Phase 2 report is dated 2nd October 2023.

A summary of the Phase 1 investigation is as follows:-

- The site is almost rectangular in shape, with maximum dimensions of approximately 50m x 13m. The site is enclosed on the north, west and south sides by terraced housing fronting onto Dalton Avenue and Thornton Avenue. To the east is a school with open ground and playing fields closest to the site.
- The site is presently occupied by two adjoining buildings used for light industry or vehicle maintenance.
- The site has an area of 500m² and is level at an altitude of 32mAOD.
- The future development requires demolition of the existing buildings.
- Much of the surrounding area is primarily residential comprising older terraced housing.
- The Coal Authority Report indicates that the site is outside a known mining area.
- There are numerous areas of infilled ground, both directly adjacent to the site and nearby that could contain uncontrolled and potentially contaminated material.



4.0 PHASE 2 SITE INVESTIGATION

The Phase 2 Ground Investigation was based on 3 boreholes to a maximum depth of 5.0m yielding soil samples for laboratory testing.

Testing was carried out on soil samples selected from trial pits and window sample holes. Tests were undertaken for the following contaminants:

- Heavy metals/metals
- PAH (USEPA16)
- Asbestos
- TPH

Contamination testing indicated some exceedances were encountered in respect of Lead, PAH and TPH and believed to be typical of light engineering and motor trade activities with a possible source being spilt fuels and oil.

The report recommended that gas monitoring be undertaken.

5.0 REMEDIATION STRATEGY

5.1 IN-GROUND CONTAMINATION

Following a review of the Phase 2 Site Investigation, and comparison with published sources, it is our opinion that the identified elevated levels of soil contamination are sufficient to pose a threat to future health but should not be considered to be as very high or dangerous levels.

Generally, it is widely accepted that there is a significant factor of safety built into maximum soil contamination levels, and the recorded levels are typically elevated above safe levels, rather than being many orders of magnitude greater.



The site post development will be almost totally covered by hard surfacing and buildings, and in these areas there will be no mechanism for a direct contact pollutant linkage. Therefore, the risk to end-users of the site will be negligible.

Elsewhere, the small areas of soft landscaping will not form private gardens and will not be suitable for home grown produce.

Therefore, a full 600mm thick clean capping layer is not proposed to these areas and a 450mm clean capping is considered to be sufficient.

We would recommend that the capping layer should consist of:

- An upper layer of 150mm of clean inert topsoil
- A lower layer of 300mm of clean inert subsoil

However, the potential for higher or differing levels of contamination exists on site away from sample positions and therefore a watching brief should be maintained to record any unexpected or obviously elevated levels of additional contamination.

The watching brief should be undertaken by this firm or other suitably qualified equivalent professional firm. In the event that contamination is identified or suspected, notification should be by the contractor's on-site personnel as soon as possible.

6.0 GROUND GASES

The monitoring boreholes were installed with ground gas monitoring wells, with response zones set within the made ground.

The assessment of potential ground gas generation was based on the observation of trends and changes in gas evolution by the direct measurement of ground gases from gas wells. The works



included measurement of methane, carbon dioxide, oxygen, hydrogensulphide, carbon monoxide, gas flows and barometric pressure.

The potential pathways into the building are:

- Horizontal and vertical migration through the ground into the building via cracks in the floor slab or around services.
- Lateral migration could occur from the adjacent infilled sites through the shallow made ground deposits and drainage annulus within service trenches.

Gas monitoring has been undertaken to confirm this low to moderate risk.

6 rounds of ground gas monitoring have been undertaken in line with CIRIA 665.

A summary of the soil gas monitoring results is presented below.

Date	BH	CH4%	CO2%	O2%	Press	Flow l/h	Weather/Temp
26/09/2023	1	0.4	4.6	17.2	1010	0.4	12°C Clear
12/10/2023	1	0.3	1.9	18.5	1009	0.6	12°C Sunny/Clear
25/10/2023	1	0.2	1.3	18.9	994	0.7	8°C Foggy
07/11/2023	1	0.2	1.9	18.8	1008	0.7	10°C Overcast/Raining
23/11/2023	1	0.2	2.0	18.7	1018	0.8	12°C Overcast/Windy
06/12/2023	1	0.1	1.7	19.4	1014	0.7	0°C Clear / Frosty

Date	BH	CH4%	CO2%	O2%	Press	Flow l/h	Weather/Temp
26/09/2023	3	0.3	10.1	16.5	1010	0.4	12°C Clear
12/10/2023	3	0.2	7.2	17.7	1010	0.6	12°C Sunny/Clear
25/10/2023	3	0.0	5.4	17.9	995	0.7	8°C Foggy
07/11/2023	3	0.0	6.8	17.8	1008	0.6	10°C Overcast/Raining
23/11/2023	3	0.2	5.5	18.0	1018	0.6	12°C Overcast/Windy
06/12/2023	3	0.0	6.9	18.4	1015	0.7	0°C Clear / Frosty

Principal: **D.J. Middleton BEng(Hons) CEng MStructE**
Company Number: **11006567**
Address **11 Bridgewater Road, Walkden, Worsley, Manchester M28 3JE**
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Gas screening values should be calculated on a borehole basis in the first instance. Consideration of worst case i.e. highest flow and highest concentrations should only be considered if the CSM warrants it. In line with CIRIA 665 Guidance on Methane and Carbon Dioxide, the site is to be developed for residential end use and the ground gas investigation has identified a maximum carbon dioxide concentration of 10.1% with flows up to 0.80l/hr recorded to date. The maximum recorded concentration for methane was 0.40%. In addition, hydrogen sulphide concentrations of 0.0 ppm were recorded.

Given the above gas protection measures are recommended for all buildings on site, however the scope of protection measures for each section will be assessed based on the building type and Characteristic Situation. This has been assessed using the matrix presented in BS8485:2015 and is presented in the table below.

Gas protection measures should be installed in accordance with BS8485: 2015. Based on a Type A development and CS2 classification a gas protection score of 3.5 to will need to be achieved.

Building Type	Floor Slab Type	Ventilation	Membrane	Required Points Score	Points Achieved
Conventional residential house (Building Type A)	Block and beam suspended floor (0 Points)	Suspended beam and block flooring with suspended ventilated void (2.5 points)	Full gas membrane installed to S8485:2015 and validated to CIRIA 735 (2 points)	3.5	4.5 points

On the basis of these results, certification of ground gas measures are classified as Situation 2 (Amber 1) conditions and ground gas protection measures should be adopted, utilising Low Permeability membrane and ventilated sub-floor void that creates a permeability contrast to limit the ingress of gas into buildings. Service entries should be sealed with appropriate Visqueen or similar specialist proprietary equipment.



Gas protection measures should be installed as prescribed in BRE 414 with the ventilation of the sub-floor void designed to provide a minimum of one complete volume change per 24 hours.

7.0 VALIDATION

Validation will be required on completion. To ensure that all elements of this Remediation Statement are properly implemented, a final Validation Report will be prepared by an appropriately qualified consultant, confirming that the remedial works have been completed.

The validation report will confirm the following:

- Confirmation that the proposed clean cover materials are suitable for the proposed end use. This will be undertaken by recovery of representative soil samples after importation for testing.
- A testing regime on imported (in situ) material will be carried out, including testing one sample per 50m³ of imported material (from a brownfield source) and one sample per 200m³ of imported material (from a greenfield source). A minimum of 3 such samples will be carried out for materials from differing types and from different sources.
- Depths of imported material will be verified by photographs on a plot-by-plot basis.
- Any material removed from site must have appropriate waste transfer documentation to confirm appropriate removal and disposal.
- Validation of installation of the gas membrane to mitigate against carbon dioxide to CS2/Amber 1 in line with the appended verification plan. This is to be carried out by an approved specialist in design and installation of this system.



A summary of actions is listed in the table below:-

Summary of Action	
Action	Person Responsible
Site Management procedures to protect site neighbours, environment and amenity during works, including a) Health & Safety plans and procedures b) Dust, noise & odour suppression/controls, including monitoring protocols c) Control of surface water runoff d) Site Waste Management Plan (SWMP)	Main Contractor
Assessment of ground conditions if unanticipated or obviously very high levels of contamination are uncovered, plus appropriate additional testing of such material.	Main Contractor Engineering Consultant NHBC Building Control
Method Statement indicating the procedure for removal of potentially contaminated material, and placement of clean cover throughout all areas of soft landscaping within the development	Main Contractor
Provide suitable protection to site utilities in accordance with the requirements of the service provider	Main Contractor
Witness/verify the placement of correct thickness of clean cover materials in accordance with the Sub Soil Surveys Ltd methodology	Engineering Consultant
Laboratory testing to confirm the suitability of the clean cover materials post placement	Engineering Consultant
Installation of Gas Membrane	Specialist Sub Contractor
Checking and validation of gas membrane	Specialist Consultant
Completion of post-site works Final Validation Report	Engineering Consultant

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APPENDIX 1

SITE LAYOUT



Principal: **D.J. Middleton BEng(Hons) CEng MStructE**
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APPENDIX 6

GAS PROTECTION VERIFICATION REPORT

Principal: **D.J. Middleton BEng(Hons) CEng MIStructE**
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GeoEnginSeer

FREELANCE DILETTANTE GEOLOGIST

Dalton Avenue,
Manchester, M14 7NR

Verification Completion Report for Ground Gas Protection Systems

Date / Time:	22.04.2025
--------------	------------

Project Title	Dalton Avenue, Manchester
Date, GESL Job Ref	22.04.2025 GESL:1739
Client	PRS Ltd
Development Type	Residential Apartments
Foundation Type	Block and Beam
Plot Numbers	Plots 5 & 6
Visit By	Bill Lawler
GESL Report Number	2225

Report By**Checked/Approved By**

Signature



Signature



Name: Mairead Morony

Name: Ben Crowther

**Company Contact Details**

PRS Ltd,
 Professional Remedial Services Ltd,
 Unit 8, Edge Lane Street,
 Parkside Industrial Estate,
 Royton,
 Oldham,
 OL2 6DS

1. GAS MEMBRANE

1.1 Condition Of Subgrade and Underside Of Gas Membrane

Check that the subgrade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria.

Unable to inspect at this stage. Although direct visual inspection shows well prepared surfaces through the membrane.

1.2 Gas Membrane Type

Manufacturer and product specification, gauge, colour, brand/name, material batch/roll numbers.

Visqueen Gas Resistant Membrane

1.3 Laps, Welds and Joint Seals

Joints lapped and sealed in accordance with manufacturers requirements/specification. Minimum overlap insured? Welds complete? Appropriate joining/double sided tape used?

Joints were fixed together by professional NVQL2 (Gas membrane installation) qualified staff using combination of heat gun hand welds and twin machine welds

1.4 Service Entries Seals

How many pipe penetrations? Top hats seal arrangements fixed around service entries? Use of jubilee clips? Etc.

Outlets and columns were sealed with Visqueen silver Pro Detailing.

2. VENTILATION SYSTEMS

2.1 Subfloor Void

Is a check possible? Void former? Gravel (type/specification)? Height of void space? Is it clear?

Subfloor void present and in excess of 150mm.

2.2 External Wall Airbricks

How many? Size? Positioning? Spacing? Etc.

Evenly spaced around the building where practicable.

2.3 Active Venting

Type of air supply: mechanical, natural, combined? Location/condition/number of fans/vents? Location and size of inlets? Provision of air cleaning devices and air heaters? Supply and exhaust duct work? Alarm provision/installation? Gas monitoring system in under-floor void?

N/A

2.4 Testing Of Air Flow

Is the air flowing sufficiently through ventilation? Anemometer reading? Smoke test? Tracer gas?

A low flow was detected through the ventilation bricks

3. INSPECTION AND INTEGRITY DETAILS

On the 22nd April 2025 the installation of the Proprietary Gas Resistant Membrane for the protection of the commercial development from ground gas was inspected at Dalton Avenue. The plot was air-Lanced at 50psi (through a 4mm aperture) and inspected.

Visqueen Gas Membrane had been installed on the unit base, with a combination of heat hand gun welds and twin machine welds with an automated welding machine.

The pipe penetrations and service entries had been sealed in situ with silver pro detailing tape. All detailing was visually inspected, measured and pick tested.

Overall, the membrane had been installed to a neat and excellent standard.

Please see photographs.

4. PHOTOGRAPHIC RECORDS





5. CONCLUSION OF SITE VISIT

5.1 Details Of Installers

Are the installers suitably qualified / trained? Names of installers / company details?

PRS Ltd.

5.2 Pass / Fail?

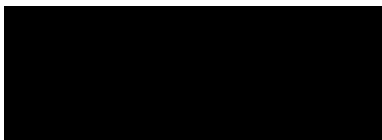
Are the measures inspected acceptable / NOT acceptable? Do they comply with the specifications? Is attention required to specific issues?

Pass

5.3 Additional notes

Remedial actions to be taken? Re-visit to be arranged?

Statement of Fact: This development as been competantly installed with the required Gas Protection Measures. Evidence of sealing between conduits and services delivered is requested.



Ben Crowther B.Sc, M.Sc, PGCE, FGS, CIEH, PCA QT, SGPV

For and on behalf of GeoEnginSeer Ltd.

geoenginseer@gmail.com

07817 108921

www.GeoEnginSeerLtd.co.uk



6.0 Limitations and Challenges of Verification Reporting

This report is based on the information that has been made available to us from the client, contractor and architect regarding the site. The conclusions drawn in the report are considered correct although any subsequent additional information or actions may allow refinement of the conclusions. It should be noted that: The report has been prepared under the express instructions and solely for the use of the Client.

The findings of this report represent the professional opinion of experienced Ground Gas System Surveyors. GeoEnginSeer Ltd does not provide legal advice and the advice of lawyers may also be required.

All work carried out in preparing this report has utilised and is based upon understanding of current relevant UK standards and codes, technology, and legislation. (BS8485:2015+A1:2019 & CIRIA 735).

Changes in this legislation and guidance may occur at any time in the future and cause any conclusions to become inappropriate or incorrect.

The report is limited to the boundaries identified by the Client on this site and confirmed within this document.

Should additional services be introduced, or service conduits are not sealed or have services provided through them at a later date that are not sealed to the conduit and or gas protection system, a retrospective fit may be required.

If a site is left open for prolonged periods following verification or works are conducted that may damage the integrity of the installation by follow on trades repairs may be needed, the standards observed in a positive verification report may be compromised. Intellectual rights to this document may be rescinded.



MSV Housing, Dalton Avenue, Fallowfield,
Manchester, M14 7NR

Verification Completion Report for Ground Gas Protection Systems

Date	17.09.2025
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Project Title	MSV Housing, Fallowfield
GES Report Number	2543
Date	17.09.2025
Client	MSV Housing
Weather	20°C Cloudy with light wind 2kmh
Development Type	Residential
Foundation Type	Block and Beam
Plot Numbers	1,2,3
GES Job Ref:	1739
Visit By	Bill Lawler

Report By**Checked/Approved By**

Signature



Name: Mairead Morony

Signature



Name: Ben Crowther

**Company Contact Details**

MSV Housing,
 Dalton Avenue,
 Fallowfield,
 Manchester,
 M14 7NR

1. GAS MEMBRANE

1.1 Condition Of Subgrade and Underside Of Gas Membrane

Check that the subgrade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria.

Subgrade had been cleared and prepared appropriately with no sharp or protruding objects.

1.2 Gas Membrane Type

Manufacturer and product specification, gauge, colour, brand/name, material batch/roll numbers.

Visqueen Gas Barrier.

1.3 Laps, Welds and Joint Seals

Joints lapped and sealed in accordance with manufacturers requirements/specification. Minimum overlap insured? Welds complete? Appropriate joining/double sided tape used?

Joints fixed together with heat gun hand welds.

1.4 Service Entries Seals

How many pipe penetrations? Top hats seal arrangements fixed around service entries? Use of jubilee clips? Etc.

Pipes had been sealed in situ with Visqueen Silver Pro Detailing Strip.

<https://visqueen.com/products/visqueenpro-detailing-strip-300mm-x-10m-500mm-x-10m/>

2. VENTILATION SYSTEMS

2.1 Subfloor Void

Is a check possible? Void former? Gravel (type/specification)? Height of void space? Is it clear?

Measured as over 150mm.

2.2 External Wall Airbricks

How many? Size? Positioning? Spacing? Etc.

Air bricks (9"x3") were spaced around the blocks approx. every 2 – 4 meters.

2.3 Active Venting

Type of air supply: mechanical, natural, combined? Location/condition/number of fans/vents? Location and size of inlets? Provision of air cleaning devices and air heaters? Supply and exhaust duct work? Alarm provision/installation? Gas monitoring system in under-floor void?

N/A

2.4 Testing Of Air Flow

Is the air flowing sufficiently through ventilation? Anemometer reading? Smoke test? Tracer gas?

Airflow too low to read.

3. INSPECTION AND INTEGRITY DETAILS

On the 17th September 2025 the installation of the Proprietary Gas Resistant Membrane for the protection of properties from ground gas was inspected at MSV Housing, Fallowfield

Visqueen Gas Barrier (blue) had been installed across the plot base, over joining internal walls and across the perimeter cavity to the edge of the outer brickwork. The membrane had been sealed together with heat gun hand welds.

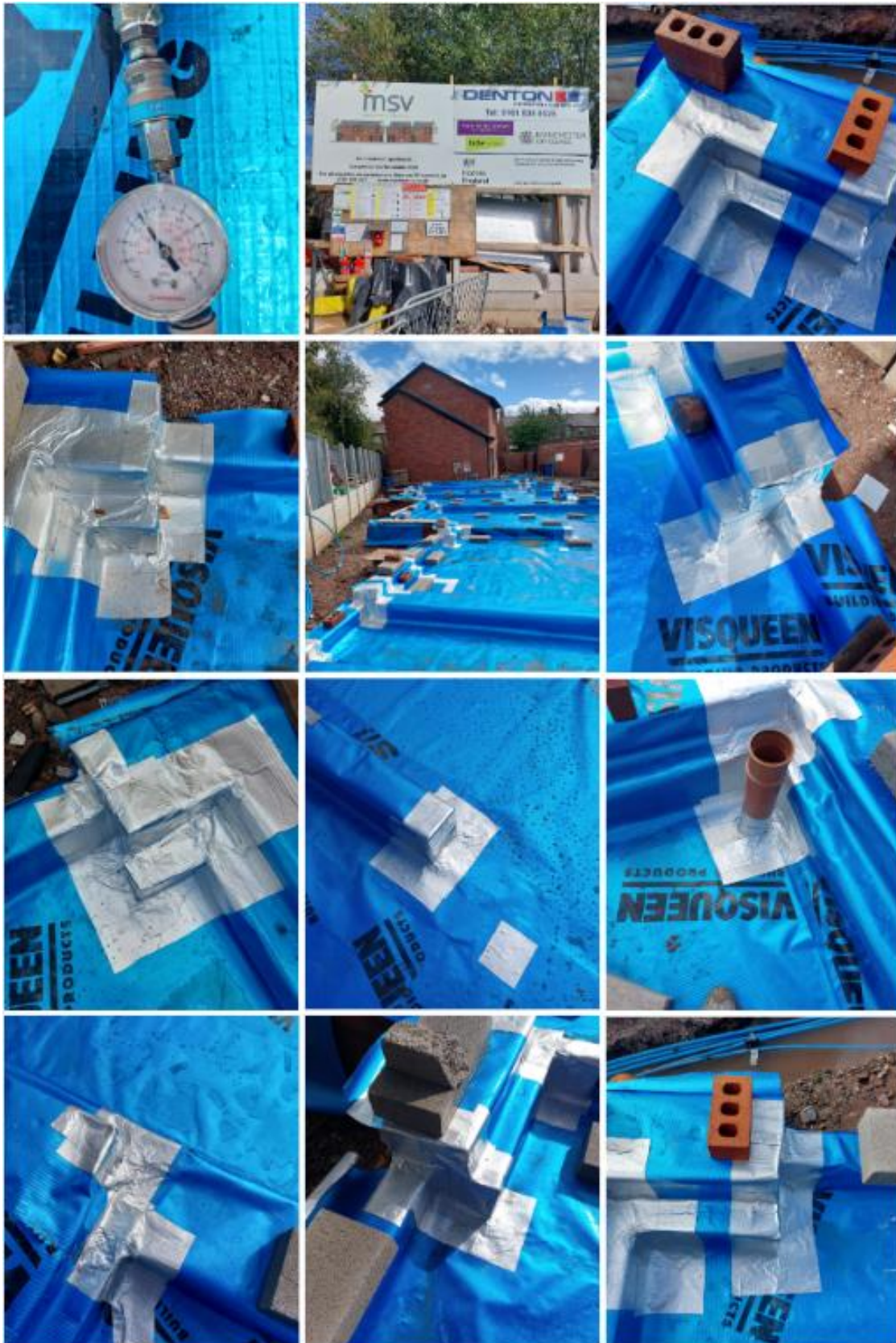
All welded seams were air lanced at a constant 50psi.

The pipes, corners and cavity corners had been sealed with Visqueen Silver Pro Detailing Strip. I pick tested, probed, and measured all detailing.

Overall, the gas membrane had been installed to a good standard, with only a few minor repairs required around the columns.

Please see attached photographs.

4. PHOTOGRAPHIC RECORDS



Site map:



5. CONCLUSION OF SITE VISIT

5.1 Details Of Installers

Are the installers suitably qualified / trained? Names of installers / company details?

PRS Ltd.
<https://gas-membranes.co.uk/>

5.2 Pass / Fail?

Are the measures inspected acceptable / NOT acceptable? Do they comply with the specifications? Is attention required to specific issues?

PASS

5.3 Additional notes

Remedial actions to be taken? Re-visit to be arranged?

N/A

If you have any questions regarding the above, please do not hesitate to contact me. Proof of a seal between the blue conduits and services introduced is requested.

Yours sincerely



Ben Crowther B.Sc, M.Sc, PGCE, FGS, CIEH, PCA-QT, SGPV
For and on behalf of GeoEnginSeer Ltd.

Commorrage, 10 School Street, of Wheldon Road WF10 2FD : 07817108921
geoenginseer@gmail.com



BGA British
Geomembrane
Association

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